

April 19, 2016

Ex Parte

Ms. Marlene H. Dortch Secretary Federal Communications Commission 445 12th Street, SW Washington, DC 20554

Re: Connect America Fund, WC Docket No. 10-90; Universal Service Reform Mobility Fund, WT Docket No. 10-208

Dear Ms. Dortch,

On April 15, 2016, Tina Pidgeon and Chris Nierman of General Communication, Inc. ("GCI") and I met with Jim Schlichting, Sue McNeil, Chris Helzer, Peter Trachtenberg, Claire Wack, and Matthew Warner of the Wireless Telecommunications Bureau, and Alexander Minard of the Wireline Competition Bureau about the above-captioned proceedings.

The GCI attendees provided material in response to questions previously asked by FCC staff. First, GCI explained the methodology used to ascertain which census blocks were "served" by AT&T or Verizon using their own facilities to offer 4G LTE service, and which areas would not be eligible for future support under the Alaska Plan. GCI overlaid the coverage shapefiles from the most recent Form 477 data, as of December 31, 2014, with the "populated portions" of 2010 census blocks in Remote Alaska (as defined by Commission rules) to compute the percentage of the population in each census block that is covered by each provider and technology. The "populated portions" of census blocks were estimated based on proximity to roads and the existence of non-governmentally owned land in an attempt to better approximate the actual locations of population within large census blocks. Consistent with the threshold adopted in the Rate of Return Reform Order for assessing overlap of a wireline rate-of-return carrier by an unsubsidized competitor, a census block was classified as served by AT&T LTE or Verizon Wireless LTE (and thus excluded from Remote Alaska base population) if 85% of the population is covered by the AT&T or Verizon Wireless LTE Form 477 shapefiles.

Once these census blocks "served" by AT&T or Verizon LTE were excluded from the Remote Alaska base population, GCI next explained its methodology for estimating the population of the remaining "served" census blocks. The calculation of remaining served census blocks eligible for support provides the basis upon which performance commitments are made.

¹ See Connect America Fund, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, FCC 16-33, 47 ¶ 121 (2016).

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To identify served census blocks, and to avoid the situation in which a single person in a census block would render that entire block "served," a census block was deemed to be served if the analysis demonstrated that 15% or more of the population in that block was within any carrier's coverage polygon, regardless of the level of service (i.e., including voice, 2G data, 3G data, or LTE). A block was categorized as "unserved" if less than 15% of the population in that block was within any carrier's coverage polygon. By this methodology, the total population of "served" census blocks in Remote Alaska, not counting those served at least 85% by AT&T or Verizon with 4G LTE over their own facilities, is approximately 144,000, based on 2010 Census population counts.²

The line demarking "served" from "unserved" census blocks is important in the Alaska Plan because "served" blocks are upgraded through carrier performance obligations, while "unserved" blocks are the subject of a reverse-auction mechanism. Thus, the Commission may choose to draw the line between "served" and "unserved" at a different level than 15%.

The population in the Remote Alaska areas subject to the Alaska Plan is the basis for GCI's revised proposed performance commitments, presented in the meeting and attached here as Attachment A. While the population totals remain preliminary and are subject to refinement, Attachment A reflects a commitment to move all fiber-backhaul areas, and the substantial majority of microwave-backhaul population, to LTE within ten years. Moreover, GCI will be implementing LTE-over-satellite to approximately half of the population served by satellite backhaul, and will be moving at least 3,000 POPs from satellite backhaul to microwave. GCI further explained that its commitments reflect the expansion and upgrade of its TERRA microwave network. GCI is working to confirm the anticipated downlink and upload speeds, but is targeting 2 Mbps downlink and 800 kbps uplink for the vast majority of the LTE-served POPs. GCI also stated that it would be willing to review its commitments at or about five years into the Alaska Plan so that they could be revised to reflect the intervening development of middle-mile facilities.

GCI also provided the attached charts (Attachment B), which estimate the population of Alaska Plan-eligible census blocks in which 85% of the population is served by each of two or more carriers. The charts break out these overlaps by service level (voice, 3G or LTE) and, for voice and 3G, by air interface family.

Finally, we urged that the Commission adopt the Alaska Plan rules and approve the carriers' performance plans in the same order, if at all possible. The Commission should nonetheless delegate authority to the Wireline and Wireless Bureaus respectively to make adjustments to the performance plans, as needed, as well as to conduct any five-year review. This would provide necessary flexibility, while allowing the Alaska Plan – for both its wireline and wireless components – to be implemented quickly and cohesively, including with respect to its budgetary aspects. Such an approach would also ensure that the Alaska rate-of-return ILECs would be able to choose between the Alaska Plan, A-CAM-based support, and Connect America Fund Broadband Loop Support, with a full understanding of all alternatives.

² Total Remote Alaska population is approximately 377,000.

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In further response to staff request, GCI is attaching hereto as Attachment C a simplified explanation of its LTE-over-satellite solution. Also, we noted that the Alaska Telephone Association was separately filing a revised copy of proposed implementing rules.³

Please do not hesitate to contact me if you have any questions regarding this matter.

Sincerely,

John T. Nakahata

Counsel to General Communication, Inc.

cc: Jim Schlichting
Sue McNeil
Chris Helzer
Peter Trachtenberg
Claire Wack
Alexander Minard

Matthew Warner

³ See Letter from Christine O'Connor, Executive Director, Alaska Telephone Association, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (filed Apr. 18, 2016).

Attachment A

GCI Draft Proposed Alaska Plan Performance Commitments - April 15, 2016

		Current Base	Current %	Year 5 Base Population	Year 5 %	Year 10 Base	Year 10 %
		Population	Served		Served	Population	Served
Fiber	LTE	5003	%8	17003	76%	65482	100%
Fiber	3G	49095	75%	37095	22%	0	%0
Fiber	Voice	11384	17%	11384	17%	0	%0
Fiber Total		65482	100%	65482	100%	65482	100%
Microwave	LTE	0	%0	0	%0	39455	83%
Microwave	36	15372	35%	39372	83%	8074	17%
Microwave	Voice	29157	%59	8157	17%	0	%0
Microwave Total		44529	100%	47529	100%	47529	100%
Satellite	LTE	0	%0	13000	49%	13000	49%
Satellite	3G	973	3%	973	4%	973	4%
Satellite	Voice	28348	%26	12348	47%	12348	47%
Satellite Total		29321	100%	26321	100%	26321	100%
Total	LTE	5003	4%	30003	22%	117937	85%
Total	3G	65440	47%	77440	%95	9047	%9
Total	Voice	68889	49%	31889	23%	12348	%6
Grand Total		139332	100%	139332	100%	139332	100%

Attachment B

Providers Serving POP/Census Blocks by Carrier and ILEC Study Area

Notes:
Excludes areas served by Veriton or ATRI LTE at 85% of the census block.
Total Non-ATTVZN LTE population is 149,510, blocks are 4783.
Total Non-ATTVZN LTE population is 149,510, and blocks are 4161, assuming a served block is one with coverage of 15% or more of the population.
Total Non-ATTVZN LTE served population is 133,313 and blocks are 3714, assuming a served block is one with coverage of 55% or more of the population.
Overlap analysis based on 85% Non-ATTVZN LTE served population threshold.

	ACS- FAIRBANK	ACS- ACS-N FAIRBANK GLACIER		ADAK TEL		B ARCTIC T	BETTLES B	BRISTOL BAYTEL B	BUSH- IO	CIRCLE	COPPER	INTERIC CORDOVA TEL CO	88	KETCHIKA MA	MATANU M		NORTH NI COUNTRY K	NUSHAGA OTZ TEL K ELEC & COOPER	TZ TEL S	SUMMIT L	UNITED	YUKON TEL CO	Study	Grand
All Count Population	SINC		SITIKA	UTILITY TELCO		ם		87	u	23		TEL COOP INC					TEL CO TE		IVE A	TIVE AK INC	NC I		DWT	Total
ш		1142	585		768						157				574					63	3		1006	1020
ASTAC						1822																	2	1824
ATT, CopperValley											522													522
ATT,MTA															4									4
CopperValley											177	611											26	814
0		m	2499	254	1745			1001	1361		9		40	1694				2232	2260	-	25325	412	5012	43905
GCI,ASTAC						0909																	89	6149
GCI,ASTAC,ATT						987																		287
GCI,ATT	3217	73267	9798	-	8412						164		12	2	1585					217	1	157	1810	4
GCI,ATT,CopperValley											5396											2	12	5472
GCI,ATT,MTA															230									230
GCI,CopperValley											192	1259												1451
GCI, CopperValley, Cordova												363												363
GCI, Cordova			658	- 22																				658
GCI,OTZ																			4698					4698
GCI, Tel Alaska													4968			2557							815	
GCI, Tel Alaska, ATT													733			3618								4351
GCI, WindyCity				72																				72
MTA															12									12
TelAlaska													161			18							328	
TelAlaska,ATT													22										2	24
Served Population @ 85%																								
Threshold	3217	24412	13540	326	10925	8869	2000	1001	1361	1	6614	2233	5936	1696	2405	6193		2232	8569	281	25329	633	9102	133323
Served Population @ 15%																								
Inreshold	3511	74848	13/63	326	11569	9003	0	1001	1361	0	1569	2256	6792	2109	6237	6370	0	2242	7158	314	25850	633	11837	143991
fotal Remote Alaska Eligible												l	-	-	r	r	r	r						
POPs	3312	24889	15161	326	11847	9003	198	1061	1541	99	2009	2264	6800	2116	6290	6383	146	2242	7158	324	26599	633	14252	149610

Providers Serving POP/Census Blacks by Carrier and ILEC Study Area

	ACS					138	BETTLES BRIS	Tot		BAGOO	55	INTER	OR KETCH	IIKA MATA	UNU MUKI	UUK NORTH	N.	NUSHAGA OTZ TEL	SUMMIT	UNITED	YUKON	Study	3
CDMA Population	FAIRBANI S INC	K GLACIER STATE	ACS-N SITIKA	ADAK TEL ALASKA UTILITY TEL CO		SLOPE TEL INC	CO BAYTEI	_	BUSH- CIRC TELL INC UTIL	CLE VALLE UTHES TEL	Y COR	CORDOVA TEL CO	N PUBLIC UT	LUC SKA TEL ASSOC	EL TELCO	D COUNTY	RY KELECS	A COOPER	CA TEL & TE	EL- UTILLINE	S TEL CO	Area	Grand Total
CopperValley		ı									726	1529	l										
90	2635	5 21450	0 10210		9927	2200					198		426	1673	1302	3616			7	136 8	85 13	157 1989	
GCI,CopperValley										\$	5392												5468
GCI,MTA															49								48
MTA															197								197
Unserved	28				866	3369		1001	1361		298	704 5	5510	23	857	2577	22	2232 69	6958 14	145 25244		412 7075	
Population @ 85% Threshold	3217	7 24412	2 13540	326				1001	1361	9	5614					6193	22				len.		

	ACS-	ACS-N				38	BETTLES BR	BRISTOL			COPPER	*	INTERIOR KETCHIKA MATANU	STCHIKA M	ATANU M	MUKLUK	NORTH NU	NUSHAGA OTZ TEL		SUMMIT UNIT	UNITED YU	YUKON	Study	
	FAIRBANN	FAIRBANK GLACIER		-			8	nt			LEY	CORDOVA TEL CO	EL CO N	N PUBLIC SK	SKA TEL TE	8	≥	EC &	ERA	& TEL-		8		Grand
GSM Population	SINC	STATE	SITICA	YTUTA	TELCO	SLOPE TEL INC		COOP	TELL INC U	UTILITIES T	TEL	TEL COOP INC	5		ASSOC IIN	INC TE	TEL CO TEL	L TIVE	/E AK	INC	INC		Unknown	Total
ASTAC						2123																	06	
ATT	30	2788			3145						2826				1366					98	4		1397	
900		m	3 2306	254	1531			1001	1361		198	1259	40	1694				2232	2260		25241	412	4729	44581
GCI,ASTAC						5759																	7	5760
GCI,ASTAC,ATT						987																		987
GCLATT	3187	21621			9809						3413		12	2	1027					194		221	1431	45570
GCI, Cordova			658									363												1021
GCI,OTZ																			4698					4698
GCI, Tel Alaska													4968			2557							815	8340
GCI, TelAlaska, ATT													712			3618								4330
GCI, WindyCity				72																				72
TelAlaska													161			18							328	202
TelAlaska,ATT													43										2	45
Unserved			193		214						177	611			12					7	84		309	1601
Population @ 85% Threshold	321	3217 24412		326		8869		1061	1361		6614	2233	5936	1696	2405	6193		2232	6958	281	25329	633	9102	133323

	ACS- FAIRRANK	ACS-N GLACIFR	ACCN	ADAK TEI	ATACKA	ARCTIC TEL	BETTLES BRIS	BRISTOL BAY TEI	RISH.	COPPER	PER COR	INTERIC	ERIOR KET	INTERIOR KETCHIKA MATANU		MUKLUK NORTH	TH NUSHAG	NUSHAGA OTZ TEL SUMMIT UNITED	EL SUMMIT	TITL UNIT	JNITED YUKON	NO S	ě	pue
3G Population	SINC	STATE	SITICA	VIII.	TELCO	ᇳ		775	u	ES		TEL COOP INC	}	ASSOC	C INC				A	-		(blank)		Total
АТТ	30	3559	1456		2158						419		144		1592					117	-		1202	10678
ATT, CopperValley											2893												12	2905
CopperValley											268	1529											56	1823
GCI		10	502		1558								136	1694				2056			5440	1	913	12310
GOLATT	3187	20721			7002	987							551	2	889							156	1454	43606
GCI,ATT,CopperValley											2927											64		2991
GCI,ATT,MTA															113									113
GCI,CopperValley											30													30
MTA															12									12
TelAlaska													2527											2527
Unserved		122	2887	326	207	7882		1001	1361		77	704	2578			6193		176	8569	1	19888	412	5495	56328
Population @ 85% Threshold	3217				10925	8869		1001	1361		6614	2233	5936	1696	2405	6193	12		8569		5329	633	9102	133323

	ACS- FAIRBANK	ACS-N GLACIER		_		BETTLES ARCTIC TELCO	ш щ	rot Bush	+ CIRCLE	COPPER	CORDOVA	INTERIOR TEL CO	KETCHIKA N PUBLIC	SKA TEL	TUK O	≿	HAGA EC &	OTZ TEL COOPERA	SUMMIT L	JNITTED	YUKON TEL CO	Study	Grand
G CDMA Population opperValley	SINC	STATE	SITIKA	VIIIII	TELCO	SLOPE	000	TEU	INC JUTILITY	316	TEL COOP	INC	5	ASSOC	INC	TELCO	TEL	TIVE	AK	N N		Jukuo	8
D	1408	16538	8211		7455	288						405	1002	*	-				16		156	362	36544
Ci,CopperValley										295	7										2		
ITA																							
nserved	1809	7874	5329	326	3470	7882		1001	1361	48	704	5531	694	4 2275	5 6193		2232	8569	265	25329		8702	
opulation @ 85% Threshold	3217							1061	1361	661							2232	6958	281	25329			-

	ACS- FAIRBANK	ACS-N GLACIER	ACS-N	ADAK TEL	ALASKA	ARCTIC TEL	BETTLES BR	RISTOL BI	USH-	CIRCLE V	VALLEY	ORDOVA TE	INTERIOR KE	TOHIKA N	2	L CO CC	UNTRY K	NUSHAGA OTZ TEL	4	SUMMIT LEL-	UNITED	YUKON TEL CO	Study	Grand
3G GSM Population	SINC	STATE	S ШКА	тпп	TELCO	교		TE 4000	ELL INC UT	TI SILITIES	E I	EL COOP IN	5		ASSOC IN	INC TE	TEL CO TE	TEL T	TIVE	AK	INC	INC	Unknown	Total
ATT	30	8693	1895		4802						6239		144		1596					117	l		1263	
129		m	411		1531								4	1694				2056			5440			
GCI,ATT	3187	15587	8256		4358	786							551	7	797					163		220	1405	35513
TelAlaska													2527											
Unserved		129	2978		234			1001	1361		375	2233	2710		12	6193		176	8569	1			5739	
Population @ 85% Threshold	3217	24412	13540	326	10925	8869		1001	1361		6614	2233	5936	1696	2405	6193		2232	6958	281				-

Wf Donutation	ACS- FAIRBANK	ACS-N GLACIER	AG-N	ADAK TEL		ARCTIC TEI	BETTLES BI	RISTOL B		GROLE V	COPPER	T AVOID IN	INTERIOR KE	PUBUC SI	27	MUKLUK NG	44	ELEC & C	OOPERA T	UMMIT U	MITTED	YUKON TEL CO	Study	Grand
rie ropustion	SIME	٦	SHEA	TION O	IEL CO	STORE IET IN	1	200	ELL INC. U	I SIIIIII	131	ET COOK III	100	4	SOC III	11	וווי מווי	IEI.	IVE IF	, Y	N.C.	INC	UNKNOWN	0131
CopperValley											5957	2211											13	8181
GCI	144												4										415	265
Unserved	3073	24410	13540	326	10925	8869		1001	1361		657	22	5932	1696	2405	6193		2232	6958	281	25329	633	8674	124577
Population @ 85% Threshold	3217			326		8869		1061	1361		6614	2233	5936	1696	2405	6193		2232	6958	281	25329	633		133323

4 16	ACS- ACS-N FAIRBANK GLACIER	ACS-N GLACIER	ACS-N	ADAK TEL ALASKA	ALASKA	ARCTIC	BETTLES B	BRISTOL BAY TEL B	BUSH- IC	CIRCLE	COPPER	INTERIO CORDOVA TEL CO	æ	KETCHIKA MATANU N PUBUC SKA TEL	-	MUKLUK NO	NORTH NUSHAGA	NUSHAGA OTZ TEL	Z TEL SUI	OTZ TEL SUMMIT UNITED COOPERA TEL- UTILITIES	UNITED YU!	YUKON Sta	Study	Grand
All Count Blocks	SINCS	STATE		UTILITY TELCO	TEL CO	E		-	U	23		TEL COOP INC	-	T AS			TEL CO TEL	TIVE	IE AK	INC	INC		own	otal
TT.		19	16		36						15				35					3	1		30	155
ASTAC						37																	1	38
ATT, CopperValley											34													34
ATT,MTA															-									1
CopperValley											53	2											5	39
901		1	111		73			80	55		-		m	36				99	76	1	581	36	77	1195
GCI,ASTAC						148																	7	150
GCI,ASTAC,ATT						7																		7
GCI,ATT	61	504	200		381						4		2	1	8					23	1	2	30	1291
GCI,ATT,CopperValley											154											'n	-1	160
GCI,ATT,MTA															60									50
GCI,CopperValley											13	32												45
GCI,CopperValley,Cordova												22												22
GCI,Cordova			22																					22
GCI,OTZ																			93					93
GCI, Tel Alaska													140			104							15	259
GCI, Tel Alaska, ATT													35			135								170
GCI, WindyCity				7																				7
MTA															2									2
TelAlaska													Э			1							6	13
TelAiaska,ATT													2										1	E
Served Blocks @ 85% Threshold	19	524	349	10	490	192		88	SS		250	SS	185	37	130	240		99	169	25	583	43	166	3714
Served Blocks @ 15% Threshold	72	563	363	10	525	193	0	80	55	o	283	63	193	43	298	248	0	89	172	31	965	43	262	4161
Total Remote Alaska Eligible CBs	73	576	474	10	554	193	23	8	78	9	302	2	197	46	324	251	28	89	172	36	689	43	496	4783
								-							-			-			The same of the same of	-	l	-

	AGS	AG-N				8	ETTLES BE	RISTOL		0	COPPER	_=	INTERIOR	KETCHIKA	AATANU R	MUKLUK	N HTMO	USHAGA OTZ TEL	- 01	NU TIMMU	V DNITED Y	UKON	Study	
CDMA Blocks	FAIRBANK S INC	GLACIER	ACS-N SITIKA	ADAK TEL ALASKA UTILITY TEL CO	-	ARCTIC TI	TEL CO BU	BAYTEL B	BUSH- C	UTITIES T	VALLEY	TEL COOP 11	TEL CO N	N PUBLIC S	SKA TEL T	TEL CO CC	COUNTRY KEL	EC &	COOPERA TI	TEL & TEL- UTIL AK INC	тез	TEL CO	- F	Grand Total
CopperValley											89	51				-		l					S	124
BG	43	3 489	218		438	97					6		38	36	8	134				13	M	2	36	1636
GCI,CopperValley											150											S	1	156
GCI,MTA															2									2
MTA															6									o
Unserved	18	35 35	131		52	95		80	25		23	00	149	1	39	106		99	169	12	578	36	124	1787
Blocks @ 85% Threshold	19			10				80	55		250		185	37	130	240		99	169	22	583	43	166	3714

			L		L	L	-						-						r		l			
	ACS- FAIRBANK	ACS-N GLACIER	ACS-N	ADAK TEL	L ALASKA	ARCIIC	BETTLES TEL CO	BRISTOL BAY TEL	BUSH-	GROLE	COPPER	CORDOVA TEL CO	œ.	KETCHIKA M.	MATANU M	MUKLUK NI	MORTH N	K ELEC & COOPER	-	SUMMIT UNITED TEL & TEL- UTILITIES		YUKON TEL CO	Study	Grand
GSM Blocks	SINC	STATE	SITICA	VTUITY	TELCO			COOP	TELL INC	UTILITIES	垣	TEL COOP INC	5	1.5 - 6 1	ASSOC IN		TEL CO TR	TEL TI	TIVE A	AK II	INC III	INC	Unknown	Total
ASTAC							45																2	47
ATT	-	8		77		82					123				95					4	7		48	200
l)9			6	66	m	51		80	0 55	,0	14	32	3	36				99	76		277	36	99	1195
GCIASTAC							140																-	141
GCI,ASTAC,ATT							7																	7
GCI,ATT	09	439	9 155	10	:**	335					84		2	1	33					20		7	13	1149
GCI, Cordova			2	2								22												44
GCI,OTZ																			63					93
GCI, Tel Alaska													140			104							15	259
GCI, Tel Alaska, ATT													34			135								169
GCI,WindyCity					1																			7
TelAlaska													Е			-							6	13
TelAlaska,ATT													3										1	4
Unserved			1.	2		22					29	s			2					1	4		11	98
Blocks @ 85% Threshold	61	524	4 349		10 4	490 1	192	80	0 55	10	250	59	185	37	130	240		99	169	25	583	43	166	3714

	ACS- FAIRRANN	ACS-N	ACC	ADAK TEL	AIACKA	ARCTIC	BRISTOL	BI CH.	COPPER	COBDOVA	INTERIOR	INTERIOR KETCHIKA MATANU MUKUK	MATANU M	MUKLUK	NUSHAGA	OTZ TEL	SUMMIT TEL & TEL	UNITED	YUKON		Pust
3G Blocks	SINC	STATE	SITICA	TUM	TELCO	SLOPE TEL	-	TELL INC	TEL	TEL COOP	INC		0 1	INC	751		AK	INC	INC	(blank)	Total
ATT		1 99	9 42		89				2	1	-		113				s	-		45	
ATT, CopperValley									122	7											123
CopperValley									37	7 51										65	93
900		.09	2 29		53						15	36			53			71	-	19	
GCI,ATT	3	0 419		-	348	7					23	1	10				19		1	13	50 04
GCI,ATT,CopperValley									58	80									S		63
GCI,ATT,MTA													v								S
GCI,CopperValley										1											-
MTA													2								2
TelAlaska											58										29
Unserved		4	116		1 21	185	80			80				240	33	3 169		511	36	83	
Blocks @ 85% Threshold	61	1 524		10			80	55	250	65 0	185	37	130	240	99		25	583	43	166	

	ACS. FAIRBAN	ACS-N GLACIER	ACS-N	ADAK TEL	ALASKA	BI	BETTLES B	RISTOL BU	AUSH- CIR	CO	OPPER	INTERIC	RIOR KET	CHIKA MATANI UBLIC SKATEL	TANU MUKLU	LUK NORTH	TH NUSHA	TAGA OTZ	TEL SUMMIT	TEL- UMILI	ED YUKON	Study	Grand	_
3G CDMA Blocks	SINC	STATE	SITIKA	UTILITY TELCO	TELCO	H		COOP TE	u	ES	TEL TE	TEL COOP INC	5					TIVE	AK	INC	INC		wn Total	
CopperValley											159	51											9	216
(20)	174	26 354	180	_	364	7							32	56	8					2			00	1006
GCI,CopperValley											59											v		8
MTA															7									7
Unserved	173	35 170	169	3 10	126	185		80	55		32	00	150	11	120	240		99	169	23	583	37	152	2421
Blocks @ 85% Threshold	9							80	55		250	59	185	37	130	240		99	169	25	583	43		3714

	AG	ACS-N				BETTLES		7.	_	COPPER		INTERIOR	KETCHIK	INTERIOR KETCHIKA MATANU	MUKLUK	NORTH	NUSHAGA	USHAGA OTZ TEL	SUMMIT UNITED		YUKON	Study	
36 GSM Blocks	FAIRBAN	GLACIER	ACS-N SITIKA	ADAK TEL	ALASKA	ARCTIC TELCO	COOP COOP	EL BUSH-	CIRCLE	VALLEY	CORDOVA	A TEL CO	N PUBLIC	N PUBLIC SKA TEL	TELCO	COUNTRY	K ELEC &	COOPERA	TEL & TEL-I	- UTILITIES	TEL CO	Ę	Grand
ATT		317	61			200		1			07		1	11		1	ı		1	1	L	48	
100			1 20		51					62				36			53			71	-	16	250
GCI,ATT	8	102 (1 143		238	7						72			2				19		9	11	
TelAlaska												29	6										
Unserved		51	5 125	10	23	185		80	55	-	43 5	59 125			2 240		13	169	-	511	36	91	
Blocks @ 85% Threshold	6	1 524	1 349	10	490	192		80	55	2				37 130			99		25				

	ACS- FAIRBAN	ACS-N IK GLACIER	ACS-N	ADAK TEL	ALASKA	ARCTIC TEL	BETTLES BRI	32	USH- CO	0,5	COPPER		INTERIOR TEL CO	KETCHIKA N PUBLIC		3 C	>	E A	SA OTZ TEL	SUMMIT TEL & TEL-	UNITED	YUKON TELCO	Study	Grand
LTE Blocks	SINC	STATE	SITIKA	UTILLTY TELCO	TEL CO	SLOPE TEL INC	8	COOP TE	TELL INC U	UTILITIES T	百	TEL COOP II	INC	5	ASSOC	INC	TELCO	TEL	TIVE	AK	NC	INC	Unknow	Total
CopperValley											210	57												2 26
109		7											1											
Unserved		523	349	10	490	192		80	55		40				130	240		99	169		5 583		43 163	3 3435
Slocks @ 85% Threshold	-	11 524		10	490			80	55		250	59	185	37				99		1 25				

Attachment C

LTE-Over-Satellite

The existing cellular network in the satellite-served communities provides voice, SMS, MMS, and 2G EDGE data services through the use of Star Solutions remote MSCs (mobile switching centers) and Vanu, Inc. software-defined radios and BSCs (base station controllers). All communities are connected to the core network in Anchorage over satellite backhaul, provided through existing GCI-owned earth stations. The core network in Anchorage consists of a gateway MSC (a gateway MSC to the rural network), GCI's wireless network centralized HLR, and core GSM (shared with UMTS) data platforms (SGSN and GGSN).

GCI plans to upgrade to 4G data speeds through a distributed core LTE system. In each of these communities, GCI will add both an eNodeB (Evolved Node B), which interacts with user handsets, and a remote EPC (Evolved Packet Core), which provides control and gateway functions for the new LTE system,. This distributed architecture also provides an interface between the remote GSM and LTE equipment (the SGs interface between the MSC and the EPC's MME) so that circuit-switched fallback is supported in each village, just as GCI currently does in its urban wireless implementations of LTE. This architecture will also allow GCI to provide local call functionality in a standalone mode if satellite or other outages disrupt connectivity to the core network in Anchorage. For each satellite-served village, GCI plans to add a remote EPC and one or more eNodeBs to each served community to provide 4G data service, and also to add antennas to existing towers for spatial diversity as necessary to improve coverage in the existing coverage area.

GCI's proposed 4G EPC-LTE deployment will install in each village all components of an EPC and LTE network, except the centralized HSS (Home Subscriber Server), which is located in Anchorage. Bench testing performed by one of GCI's vendors indicates that the extension of the HSS link through the S6a interface over satellite is viable. GCI's HSS provider also concurs that the S6a interface works over geo-stationary satellite links. Connection between each village's remote EPC and the Internet will be achieved with standard 3GPP (3rd Generation Partnership Project) IP interface (via the SGi interface), with which GCI has extensive experience. GCI uses a wide variety of transmission methods and systems such as satellite link acceleration, payload and header compression, and link optimization to deliver TCP/IP throughputs at speeds in excess of 15 Mbps. GCI is not aware of any deployments using this specific combination of technologies and systems, but multiple vendors have come forth with proposals to provide this type of "EPC-in-a-Box" system solution. With this technical solution, GCI plans to target throughputs from the remote base stations to the end user in these communities of 7 Mbps download with a reference signal received power (RSRP) of -108 dBm, both speed and power as measured outdoors. The end user, however, could easily register lower download speeds depending on the actual radio frequency path, the

Attachment C

system loading, and the availability and cost of backhaul. GCI believes that under normal operating conditions that end users will expect to experience speeds of 2 Mbps download and 800 kbps upload.